CADER
Siting & Environment
Committee
ACTION PLAN

March 11, 1997
Third Working Draft

COMMITTEE MEMBERS

This is a working draft that does not yet necessarily represent the views of the entire committee, whose members presently include:

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CONTENTS

The siting and environment action plan is composed of:

1. A goal statement expressing the plan's objectives and a strategy statement describing how to achieve the objectives.

2. Profiles of the technologies being sited and permitted (final version to be provided by CADER Committee No. 5).

3. A profile of California permitting applicable to distributed resources.

4. Seven major barriers to goal achievement and proposed solutions for eliminating or reducing the barriers.

5. Proposed assignments of solution implementation, including responsibilities, costs, and timing.

The plan's structure and content is subject to change based on further committee work and the need for consistency with other CADER committees' emerging plans. The committee's process for completing the plan includes: 1) detailing of barriers and solutions by the committee's "solution teams;" 2) full committee review of the third working draft, and revision into a fourth draft following the Committee's March 17 meeting; 3) distribution of the fourth draft to the full CADER group on or about April 1; and 4) incorporation of CADER comments and production of a final plan document during May-June 1997. The committee's "solution teams" include:

Policy Support	Paul Richins, Barry Garelick, Byron Washom
Public Information	Jackie Stroud, Matt Layton
Regulator Information	Matt Layton, Jackie Stroud
Permitting Information	Paul Richins, Shirley Rivera, Jackie Stroud
Community Planning	Eliot Allen, Neal Johnson
Regulatory Streamlining	Shirley Rivera, Kevin Bruch, Barry Garelick, Ken Lim
Emissions Compliance	Kevin Bruch, Ken Lim, Edan Prabhu

GOAL & STRATEGY STATEMENTS

Goal

To establish distributed energy resources (DR) as a recognized option for meeting energy needs by removing barriers to DR siting, and by encouraging DR permitting that is timely, orderly, and efficient.

Strategy

1. Identify barriers that are impeding DR siting and permitting.

2. Increase familiarity with DR to make it a commonly-accepted supply option.

3. Focus on the DR strengths of diversity, flexibility, and minimal impacts.

4. “Pre-plan” DR facilities as integral parts of communities’ energy infrastructure.

5. Collaborate with regulators to streamline DR permitting where appropriate.

TECHNOLOGIES PROFILE *Continued*

TECHNOLOGIES PROFILE

(Pending Receipt of Committee No. 5 Info)

	Technology Characteristics		**Siting & Environmental Characteristics**						
	Generating Capacity	**Fuel or Energy Source**	**Commercial Availability**	**Land/Space Required**	Air Emissions	Noise	Water Needs	Waste Production	Hazardous Impacts
Generation									
Internal Combustion Engine	5 kW to 10 MW	Natural gas, diesel, liquid fuels	Now	0.9 to 1.3 ft^2/kW	TBD	TBD	TBD	TBD	TBD
Combustion Turbine	500 kW to 50 MW	Natural gas, liquid fuels	Now	0.1 to 0.4 ft^2/kW	TBD	TBD	TBD	TBD	TBD
Micro Turbine	20 to 100 kW	Natural gas, liquid fuels	Near term	4-25 ft^2	TBD	TBD	TBD	TBD	TBD
Fuel Cells	500 to 5,000 kW	Natural gas, landfill gas, coal gasification, LPG, propane	Now	2.5 ft^2/kW	TBD	TBD	TBD	TBD	TBD
Photovoltaics	1 to 1000 kW	Solar	Now	400 ft^2	None	None	None	None	TBD
Small-Scale Wind	1 to 10 kW	Wind	Now	TBD	None	None	None	None	TBD
Stirling Engine	10 to 20 kW	Hybrid solar/natural gas	Now (10 kW)	5-9 ft^2	TBD	TBD	TBD	TBD	TBD
Storage									

TECHNOLOGIES PROFILE *Continued*

Batteries	1 to 10 MW	Off-peak electricity	Now	3 ft^2/kW	TBD	TBD	TBD	TBD	TBD
Flywheel	100 kW/30 sec. 1 MW/5 hrs.	N/A	Near term	4 ft^2/kW	TBD	TBD	TBD	TBD	TBD
Superconducting Magnetic Energy Storage (SMES)	750 kW to 1.4 MW	N/A	Now	TBD	TBD	TBD	TBD	TBD	TBD

Sources: EPRI, 1992; CEC, 1996.

TECHNOLOGIES PROFILE *Continued*

PERMITTING PROFILE

(See detailed requirements in Appendix A)

Agency	Major Permits	Potentially Affected DR Technologies									
		IC Engine	Comb. Turbine	Micro Turbine	Fuel Cell	Solar PV	Small Wind	Stirling Engine	Batteries	Flywheel	SMES
Applies Statewide											
City/county planning	Zoning; CEQA	X	X	X	X	X	X	X	X	X	X
City/county building	Building/electrical/fire	X	X	X	X	X	X	X	X	X	X
AQMD*	Construction/operation	X	X	X	---	---	---	X	---	---	---
Regional WRCB	Discharges (multiple)	X	X	X	---	---	---	X	---	---	---
Others Potentially Statewide											
Fish & Game	Alteration	---	---	---	---	---	---	---	---	---	---
State Lands	Encroachment	---	---	---	---	---	---	---	---	---	---
Water Rights	Appropriation	---	---	---	---	---	---	---	---	---	---
PUC	Convenience/necessity	X	X	X	X	X	X	X	X	X	X
CIWMB	Solid waste	---	---	---	---	---	---	---	---	---	---
Caltrans	Encroachment	---	---	---	---	---	---	---	---	---	---
Toxic Control	Hazardous waste	X	X	---	---	---	---	---	X	---	---
Applies Regionally Only											
Coastal Comm.	Coastal permit	X	X	X	X	X	X	X	X	X	X
Bay Area Comm.	Development permit	X	X	X	X	X	X	X	X	X	X
TRPA	Development permit	X	X	X	X	X	X	X	X	X	X
Reclamation Bd.	Encroachment permit	---	---	---	---	---	---	---	---	---	---

***** Includes ARB and EPA permits/assessments.

BARRIER NO. 1: Policy Support

There is limited federal and state, and virtually no local, policies acknowledging DR as a valid technology choice for meeting energy needs. Lack of policy support creates an uncertain climate for DR when it is proposed, hindering efficient siting and permitting.

Solutions

Identify and disseminate supportive policies that do exist, as shown in Table 1.1.

Table 1.1
Supportive Public Policies

DG/DR Technology	Administering Agency	Brief Description of Policy*
Fuel cells	CPUC--California Public Utilities Commission	AB 1890, Section 371(b) provides for certain exceptions to the volumetric based CTC. This could be considerable in the first 4-5 years of restructuring as the CTC is estimated at 3-4 cents/kWh.
Micro-cogeneration < 1 MW	CPUC	AB 1890, Section 372(c) provides for financing to cover the costs of the CTC which in the first 4-5 years of restructuring is estimated at 3-4 cents/kWh.
Renewable technologies	CEC--California Energy Commission	AB 1890, Section 383 sets funds aside to support renewable energy technologies.
New and emerging technologies	CEC	AB 1890, Section 383 sets funds aside for new and emerging in-state technologies.
Solar (< 10 kW)	CPUC	SB 656 (Alquist), Public Utilities Code, Section 2827 provides for net energy metering for small solar up to a total of 53.3 MW statewide. Net energy metering requires the utility to pay the same price per kWh for solar energy generated as the utility charges the given customer for electricity.

* Secure a copy of each policy noted for inclusion in the CADER data file.

Advocate adoption of new policies that reinforce the merits of DR, as shown in Table 1.2. Efforts should be focused on the CEC's BR (or subsequent policy plan that may come with market

restructuring); relevant policies of agencies such as ARB and Caltrans; the policy positions of the California League of Cities and State Association of Counties; and policies of the councils of government in the state's major metropolitan areas (for example, see SANDAG's Regional Energy Plan model treatment of DR in Appendix B).

Table 1.2 Suggested New Public Policies to Reinforce DR Merits		
DR Technology	Administering Agency	Suggested New Policy

Implementation

Who: Public/private consortium of DR stakeholders, e.g. CADER or similar.

When: Near-term priority.

Cost: $24,000 in professional fees (2 days/month @ 24 months) plus in-kind labor from stakeholders.

Funding Source: Stakeholder consortium. Two models should be considered for leveraging stakeholder funds while simultaneously building alliances: 1) California's Coalition for Energy Efficiency and Renewable Technologies (CEERT) which is composed of independent renewable power producers and DSM/environmental advocates; and 2) the National Geothermal Heat Pump Consortium, composed of manufacturers, vendors, and efficiency advocates in partnership with USDOE.

BARRIER NO. 2: General Public Information

A lack of information and understanding by various groups of people about DR, specifically distributed generation and storage, acts as a barrier to the use and acceptance, and efficient permitting and siting of DR projects. There are two general types of roles which need to be addressed by the information needs: proactive planning for DR facilities, and responding to the need for permitting a specific facility. The same group or audience may be involved in both roles, as described below.

Regulators, who will need technical information for permitting (covered in Barrier No. 3), will also need other types of information to understand DR. It is noteworthy that "regulators" frequently have the additional role as planners who need sufficient information to consider using DR as an option. For example, a local planning department may need to issue a permit for a project. The planning commission may also need to approve of the project. Additionally, the planning department and commission may develop policies for their general plan which may affect particular types of energy facilities. A board of supervisors or city council can also have a proactive role in encouraging the development of certain types of facilities, as well as approving or disproving some developments. The general public also plays a role in expressing approval or disapproval of a specific project in its neighborhood, as well as participating in local planning efforts.

Although there may be only a specific role for some audiences, cooperation and efficient actions may be more readily obtainable when the audience has an understanding of the 'bigger picture' such as the uses and benefits of DR. Audiences for general public information include:

Permitters, planning commissioners, boards of supervisors, city councils

This group of audiences can be involved in the approval of projects as well as in the development of local policies and ordinances which can affect future projects. For local agencies to develop policies which encourage particular technologies, they will need to know a broad range of information including benefits for their area, economic

considerations, potential siting issues, and information about the technology. These local agencies should be encouraged to have open communication with power providers in their community for meeting the needs of local development.

Local and state health and safety officials

This group of audiences can also be involved in the approval of projects as well as in the development of policies which can encourage project development. They need to have awareness of DR and understand the benefits, as well as more specific technology information and siting issues.

Other elected and appointed officials at the state level

Officials at the state level can affect policies which can encourage the use of DR in state facilities as well as in a broader context.

Local departments of community development, planning, general services and public works

Departments such as these can be involved in the planning for the use of DR technologies in public buildings and other facilities. They will need to know about appropriate applications, benefits, economic considerations, siting issues, and technology information and the interface between DSM and DG in which total benefits and economics are calculated based on the 'whole package.'

End-users of high quality electrical power

Certain businesses, for example, computer chip manufacturers and certain heath care providers (such as positron emission tomography and kidney dialysis) depend on a reliable power source. Such potential end-users need to be aware of DR as an option. These establishments may be willing to pay a higher price for a reliable power source.

Local media

The media needs to provide accurate information in regards to any proposed facility or policy relating to DR. The local media might also be interested in being end-users of reliable DR power in emergency situations, enabling them to keep "on the air" when their competitors may not be.

General public, including neighborhood groups and associations

The general public can stop what may be a worthy project because it does not understand the project, the technology, and the siting issues, if any, and their mitigation. 'Neighbors' need to be informed early and brought into dialogue with project developers. Public citizens may also serve on advisory groups for the development of general plan energy elements or other local policies which can affect the deployment of DR and may express opinions at local hearings on these plans and policies.

Ratepayer advocates

Projects may be opposed inappropriately if there is inadequate understanding about all the benefits and the economics of the project - for the utility and for the end-user.

Environmental organizations and activists

These will need siting and related technology information, as well as an understanding of environmental and other benefits.

Building industry associations, professions and architects and building contractors.

These will need to know about applications, benefits, economic considerations, including the interface between DSM and DG in which total benefits and economics are calculated based on the 'whole package.' Architects and general contractors will also need 'hands on' information about installation to secure maximum benefits and how the specific technology can be incorporated into existing structures, parking lots, shopping centers, etc. They need awareness of the availability of DR and specific best applications for use.

Key union groups associated with DR installation

Specific technology and health and safety information will encourage their participation and support for the projects.

The types of information that should be provided to these audiences include (types differ by audience type):

Definition and examples of DR. Include diagrams. Technology descriptions, both detailed and general, depending on the audience and its role.

Applications and benefits of DR in the power system and for the different types of customers

(industrial, commercial, and residential). Grid- and non-grid connected. Provide case examples of completed projects.

Describe how local governments will be involved as DR use increases. They will be more involved in permitting and as end-users. Greater need for public awareness in general of the benefits to the locals (governments and general public).

Potential siting issues associated with the different technologies. Provide comparison with non-DR power resources.

Economic considerations. The added value of reliable and modular power supply. The provision of local jobs. Developing "partnerships" to share costs, benefits and risks. Identifying the stakeholders. Working with ESCOs. Integrating DSM to achieve highest value.

Operational issues, including staffing needs, maintenance, controls.

How DR and its useful benefits might fit into a deregulated environment as this relates to choices that end-users will make regarding the source of electricity they use.

Solutions

2.1 Prepare written information packages for specific audiences. Much of the information will be the same in all the packages. Include resources for locating additional information. The contents of the to-be-developed DR supplemental chapter of the ***Energy-Aware Planning Guide: Energy Facilities*** will serve as an information source and be designed for similar audiences. Other educational tools could be developed that could be used by others, rather than developing specific material for general public audiences.

2.2 Host "forums" of various stakeholders in different parts of the state. Include presentations, written information and videos, panel discussions, Q & As. Emphasize "partnerships" or developing alliances to maximize benefits and minimize costs and risks. Demonstrate the linkages among the stakeholders. Invite local and regional government representatives as well as other stakeholders. Identify interests and potential concerns of end-users and the general public. These "forums" will help identify further educational/informational needs, i.e., flush out this barrier. A second follow-up "forum" at each location would be useful.

2.3 Develop a "speakers' bureau" of persons available to make presentations at, for example,

boards of supervisors and city council meetings. Invite neighborhood associations. This could be used to aid in planning purposes, as well as for specific projects which need permitting.

2.4 Prepare a video which presents various DR facilities and shows examples of applications and siting of the technologies. It may be possible to obtain and edit existing videotapes.

2.5 Develop a resource listing and descriptions of exemplary DR facilities. Set up available tours to some of these facilities in different areas of the state to provide for ease of access to local government planners, regulators, local or state elected or appointed officials, and representatives of public organizations, such as neighborhood associations and environmental groups. Include contacts on the Energy Commission web site for arranging tours or addressing concerns they have.

2.6 To assist with the establishment of DR as a recognized option, work with service provider stakeholders to identify possible applications of premium quality power to be able to inform the end users about the potential for DR use.

2.7 Include the "public" DR information on the Energy Commission web site.

Implementation

Who: DR stakeholder consortium.
When: Near-term priority.
Cost: $20,000, assuming partial reliance on existing materials.

Funding
Source: Stakeholder consortium.

BARRIER NO. 3: Technology Information for Regulators

The lack of specific information, or universally accepted standards, for distributed energy resources may lead to slow regulatory review, or denial, of project applications. These hurdles may prevent distributed energy resources from being used in the most beneficial and appropriate applications and increase regulatory costs and uncertainty. While regulators are not responsible for the selective development of new and emerging technologies, they are required to provide complete and timely reviews of applications against applicable rules and regulations. Faced with new technologies, regulators need detailed technical information to address the regulatory requirements and questions from local officials and the public.

There is a scarcity of technical distributed energy resource information available to the following key regulatory audiences: 1) air quality; 2) fire and safety; 3) water quality; 4) hazardous and other wastes; 5) land-use; and 6) local building officials. Regulators need detailed descriptions of the most likely distributed energy resources, as well as sources of information on other potential technologies. The information would describe the physical characteristics, the inputs (***e.g.,*** fuel, water, chemicals), the outputs (***e.g.,*** waste water, air pollutant emissions, energy), and highlight operating or permitting experiences. A description of the benefits of distributed energy resources would be of secondary importance to regulators because they are not charged with promoting technologies. However, since identification of disadvantages relating to distributed energy resources may highlight permitting issues, providing the potential benefits to regulators may assist them in resolving permitting issues.

Solutions

3.1 Prepare a technical information package (equipment specifications, research data), and disseminate statewide to: 1) key agency officials; 2) permit assistance centers; and 3) regulator associations. Efforts should be focused on such groups as: California Air Pollution Control Officers Association; California Chapter of the Association of Environmental Professionals; California Association of Building Officials; California Chapter of the American Planning Association; Association of Energy Managers, Association of Energy Engineers, and California Planning Directors Association.

Implementation

Who: Distributed energy resource stakeholder consortium.

When: Near-term priority.

Cost: $10,000, assuming partial reliance on existing materials.

Funding

Source: Stakeholder consortium.

3.2 Create a distributed energy resource clearinghouse. The clearinghouse would be an information resource for all stakeholders as well as regulators. Additionally, stakeholders, including regulators, will be able to provide information to the clearinghouse on the validity of the existing data, and appropriate updates based on permitting and operating experience.

Implementation

Who: Distributed energy resource stakeholder consortium.

When: Long-term priority.

Cost: Unknown, it may be possible to initiate the clearinghouse through the inertia generated by the current collaborative process. Long-term maintenance of the clearinghouse would have to be funded by the stakeholders.

Funding

Source: Stakeholder consortium

3.3 Create permitting and performance standards for distributed energy resource technologies. Make the standards available through the clearinghouse as templates for regulators reviewing projects or creating agency specific standards

Implementation

Who: Distributed energy resource stakeholder consortium and affected regulatory bodies

When: Long-term priority.

Cost: Unknown.

Funding

Source: Stakeholder consortium

BARRIER NO. 4: Permitting Information for DR Developers

Information on statewide siting and environmental permitting requirements is not available in a consolidated manner for DR developer use. Requirements are contained in multiple agency codes, and in some cases are ambiguously defined in regard to DR. The absence of a single database of concise and clear permitting information hinders siting and permitting efficiency.

Solutions

4.1 Compile an electronic database of statewide permitting requirements for each DR technology, and maintain the database on an Internet web page. The "permitting profile" at the beginning of this plan is a preliminary concept of the proposed database. Use the assembly of the database as an opportunity for clarifying ambiguous regulations.

4.2 Insure that state and local permit assistance centers have been briefed on DR and are adequately prepared to respond to developer inquiries. Conduct DR orientation sessions at major permit centers.

Implementation

Who: DR stakeholder consortium with the California Office of Permit Assistance.

When: Near-term priority.

Cost: One person-month for database start-up; one person-day per quarter for database maintenance. One additional person-month for permit assistance center coverage.

Funding Source: Stakeholder consortium.

BARRIER NO. 5: Community Planning

DR is often opposed as an incompatible land-use because of negative perceptions of DR appearance, noise, pollution, traffic, and EMF. Such opposition, although often unfounded, slows the siting process and increases its costs. At the root of such opposition is often a community plan that does not address energy infrastructure needs, and does not include a vision of how the community wants to meet those needs. Without any consideration in the community's dialogue about its future, it is not surprising that opposition erupts when an unfamiliar and unplanned element is proposed to be introduced. The absence of any explicit DR role in community plans undercuts the credibility of DR as a worthy supply option.

Solutions

5.1 Advocate the inclusion of DR siting policy in city and county general plans, and DR siting regulations in zoning ordinances, in advance of project proposals. If DR is already an integral part of community plans, that position will help reduce the contentiousness of siting when DR is actually proposed. About 50 California cities and counties have adopted energy plans, as well as the Los Angeles and San Diego regional councils of governments. Of these local and regional energy plans, several specifically promote DR as a preferred supply option. In the San Diego region, for example, DR is the top technology preference for new electric generation. This and other examples of local DR policies are given in Appendix B.

5.2 In addition to encouraging cities and counties to voluntarily incorporate DR in local energy plans, a watchdog role could also be assumed by DR stakeholders to insure that ***required*** energy facility planning is, in fact, accomplished. Specifically, California Government Code Section 65451(a) requires that local government "specific plans" include information on intended "energy facilities." The watchdog group could monitor the preparation of specific plans to insure compliance with this minimum statutory requirement.

5.3 Prepare and disseminate land-use impact comparisons of DR versus DR alternatives such as T&D upgrades or new central station generation to illustrate how DR can minimize community impacts. These comparisons could be produced in a fact sheet format, and be

derived from the CADER technologies profile. Also, the CEC's Energy Aware Planning Guide for Energy Facilities could include a matrix-style comparison in its upcoming chapter on DR.

5.4 Develop and distribute modeling tools for simulating DR siting and community impacts. Such models would be a bridge between sophisticated technology performance characterization models, and the needs of citizens to see how a particular plant would fit into their neighborhood. Ideally, such modeling should be integrated with existing community GIS and databases in order to efficiently accomplish the modeling, and to reinforce the integral nature of energy facilities in local planning.

Implementation

Who: DR stakeholder consortium.

When: Near-term priority.

Cost: $100,000 in professional fees plus in-kind labor from stakeholders.

Funding Source: Stakeholders.

BARRIER NO. 6: Regulatory Streamlining

Siting and environmental standards that differ across local jurisdictions are impeding DR siting; and the absence of pre-installation certification procedures further increases permitting time and costs. [note to reviewers: please provide specific examples]

Solutions

6.1 Initiate legislation and/or rule-making that creates uniform DR standards and implements them through pre-installation certification programs. This can be approached as an amendment of California's Permit Streamlining Act (California Code 65920-65963).

6.2 As part of any legislation or regulatory streamlining, explore the concept of "master" permitting where a single permit would be issued for multiple DR plants up to a stipulated total installed capacity, e.g. a total of 10MW at six different locations under one master permit.

6.3 Prepare CEQA instructions, organized by DR technologies, that explain what kind of environmental information is required for DR proposals; how to assemble and present it; and how to facilitate its timely review.

Implementation

Who: DR stakeholder consortium with COPA.

When: Near-term priority.

Cost: $50,000 in professional fees plus in-kind labor from stakeholders.

Funding Source: Stakeholders.

BARRIER NO. 7: Emissions Compliance

Some DR technologies have difficulty meeting current emission standard, and certain air districts fear that DR will lead to air quality deterioration. The concern of some air districts in California regarding DR was included in recent testimony of the staff of the California Energy Resources Conservation and Development Commission, ("ER 96 Draft Testimony on: Research, Development, Demonstration and Commercialization Issues"; Docket No. 95-ER-96; August 8, 1996; prepared for the September 5, 1996 ER 96 Committee Hearing). The air districts' arguments presented in the testimony (page 15) reflect not so much a concern that DR technologies will have difficulty meeting current emissions standards, but that no standards will apply. The argument put forth by the air districts is that DR will comprise mostly small gas turbines and internal combustion engines. They state that

> "...small gas turbines and internal combustion (IC) engines, when deployed in large numbers and operated on a regular basis, may adversely affect local and regional air quality conditions. Such problems may occur because most air districts in California have not developed and implemented control strategies to accommodate the large-scale deployment of such technologies."

The testimony references both Bay Area AQMD and San Luis Obispo APCD as stating that because of the size and limited hours of operation of the small gas turbines and IC engines, control technology is not warranted nor required. A proliferation of such projects, in the air districts' opinion, will result in unbridled air pollution. The testimony cites a precedent of SMUD in 1991 presented with such a situation. SMUD was attempting to expand its "Load Shed" program in which large commercial and industrial customers contracted to use their emergency backup generators to help meet peak demand during certain times of year. In light of that situation, the Sacramento APCD established a policy whereby backup generation units taking part

in the program would lose their standby exemption and be required to install emission control technologies. According to the testimony, as a result of such policy "the expanded use of backup generators in SMUD's Load Shed program never materialized".[1]

[1] The discussion in the testimony is limited to very small units that escape permitting requirements. It fails to include larger projects such as cogeneration units that are "base loaded" (rather than on backup status) and which are subject to the district permit and control technology requirements. Such projects, in many cases, supplant existing boiler use and can result in a net decrease in emissions. Furthermore, despite in-plant emission decreases, many air district rules still require that emissions from such projects are subject to BACT analyses. In California, BACT for such projects is quite strict and generally requires the use of Selective Catalytic Reduction (SCR) systems to control NOx.

Solutions

7.1 Establishing Cause and Effect Relationships

Air districts allow for certain amounts of growth in air emissions as part of the planning process. Some districts could allow for such growth—in part—by accounting for reductions in emissions that will come about as a result of California's mandate for certain percentages of electric vehicles and ultra-low emitting vehicles to be sold in the state.

Districts may argue that the utility-generated electricity for EV's is lower on a lb/MW basis than the small turbines and IC engines.[2] But, accounting for the effect of small turbines and IC engines must consider the predicted power-plant "mix" that produces the electricity in California. While the amount of power from DG plants will increase, it is safe to say that power in California will not be supplied totally from DG, nor totally from SCR-controlled power plants within southern California, For example, presently in the South Coast Air Basin, approximately 80% of the power consumed is imported from out-of-state. (California Air Resources Board, 1994) While some of this power originates from hydroelectric and nuclear sources, some also comes from coal-fired utilities in Arizona and New Mexico. Air districts therefore must determine whether emission reductions from EV's will be compromised by emission increases from small turbines and IC engines, or whether the increases can be accommodated.[3]

The question that must be addressed is whether—and by how much—the composite power plant emission rate that includes DR will be less or greater than the emission rate from the gasoline-fueled motor vehicle population displaced by EV's. It is then necessary to quantify the extent to which DR plants contribute to any shortfall in emission reduction goals envisioned by use of EV's. Given such information, it would be possible to define a target emission rate for small DR sources, similar to the procedures followed in establishing growth allowances.

Regional effects—i.e., ozone transport—must also be considered, in light of changes that may come about if the EPA's proposed 8-hr ozone standard goes into effect. EPA is considering establishing "Regional Air Management Plans" or RAMPs. The RAMPs would function as mini-OTAG regions in the western states. As a result, California could be held accountable via the

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2 The average NOx emission rate of a fleet of 1993 average vehicles is 1.2 grams/mi. By comparison, the grams/mi equivalent of power generated in the South Coast Air Basin ranges from 0.004 to 0.03. (CARB 1994).

3 Considering the power plant "mix" of electricity generated in-state and out-of-state, the grams/mi equivalent of NOx from such mix ranges from 0.16 to 0.23—still less than the 1.2 g/mi NOx emission rate associated with gasoline-fueled vehicles. (CARB 1994)

SIP process for transport effects in downwind transport areas.

From this regional perspective, the issue of DR and EV's becomes complex. Under the RAMP scheme that EPA is considering, Arizona and New Mexico could claim that increase in EV use in California is causing an increase in emissions at the coal fired plants there, thus jeopardizing their attainment of the ozone standard. States downwind of Arizona and New Mexico that are part of a defined transport region could also lay claim to California. On the other hand, the decrease in automobile emissions in California could also result in a benefit in downwind states.

In the future situation of increased DR, there may be less power imported from out of state, resulting in decrease in demand from coal-fired sources in Arizona and New Mexico. Therefore, emission reductions from EV in California may not be as great as would be if out-of-state power were imported at the present rate. But, from a regional perspective, air quality benefits may be more extensive.

It therefore comes down to an exercise of Pareto optimality of air quality benefits. Air quality benefits are maximized in California by EV use and a certain level of imported power, while downwind states suffer disbenefits. Air quality benefits are lessened in California if DR is increased, but downwind states would see fewer emissions. How this is calculated would involve economic models to predict power plant mix, emission inventories, and photochemical modeling—all tools that are currently used in the air quality planning process.

7.2 What Level of Control is Needed?

The concern of increased air pollution via proliferation of DR units cannot be ignored. The lack of a regulatory mechanism such as BACT or LAER for the small under-the-permit-threshold sources provides an unexpected solution. Since the units are typically small enough to not trigger BACT and LAER, the opportunity exists to try an alternative that would not be allowed BACT or LAER: voluntary agreements.

Under voluntary agreements, various industry sectors work together with governmental agencies and environmental groups and arrive at a level that the regulated community can commit to in a specified time period, say 5, 7, 10 years. At the end of the agreed upon time period, the equipment manufacturers will produce GT's and IC engines that achieve a specific emission rate. The emission level is in part determined by the planning process described above which would help define the amount of emission increase that could be accomodated by DR. It is also determined by input from the manufacturing sector.

Target emission goals opens up the arena to competition between the manufacturers and gives the regulators assurance that emissions will not be "unbridled" and can plan accordingly. The equipment manufacturers are assured of the level that will be required for permits, rather than a situation of uncertainty such as case-by-case BACT.

In fact, the recommendation contained in the testimony (page 17) would allow for such an approach. The testimony recommends that the California Energy Resources Conservation and Development Commission

> "work with local and regional government staffs such as building inspectors, planners, and air district staffs, organizations such as CAPCOA, and state agencies such as ARB to identify and develop a certification/standardization program for small, fixed or modular electrical generators that provide electricity at the neighborhood level and which allow the facilities to be installed with minimal or no permit review. Any standards should encourage innovation with some room for individualized approaches, rather than being so narrowly focused that innovation is stifled."

References: California Air Resources Board 1994; Technical Support Document: Zero-Emission Vehicle Update; Mobile Source Division, Air Resources Board; April

Implementation

Who: Manufacturers and regulators.

When: Ongoing.

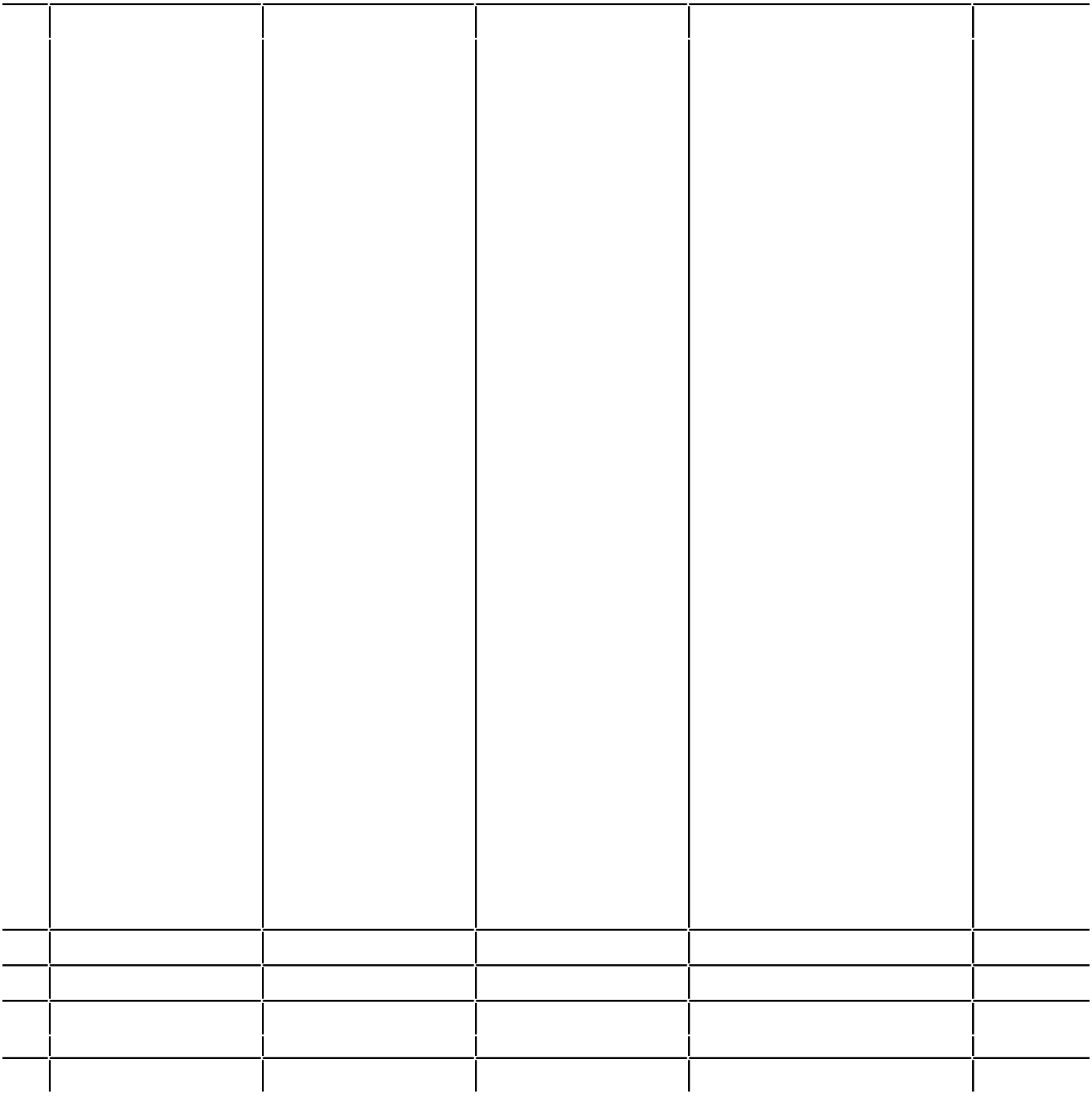
Cost: N/A

Funding Source: N/A

Appendix A

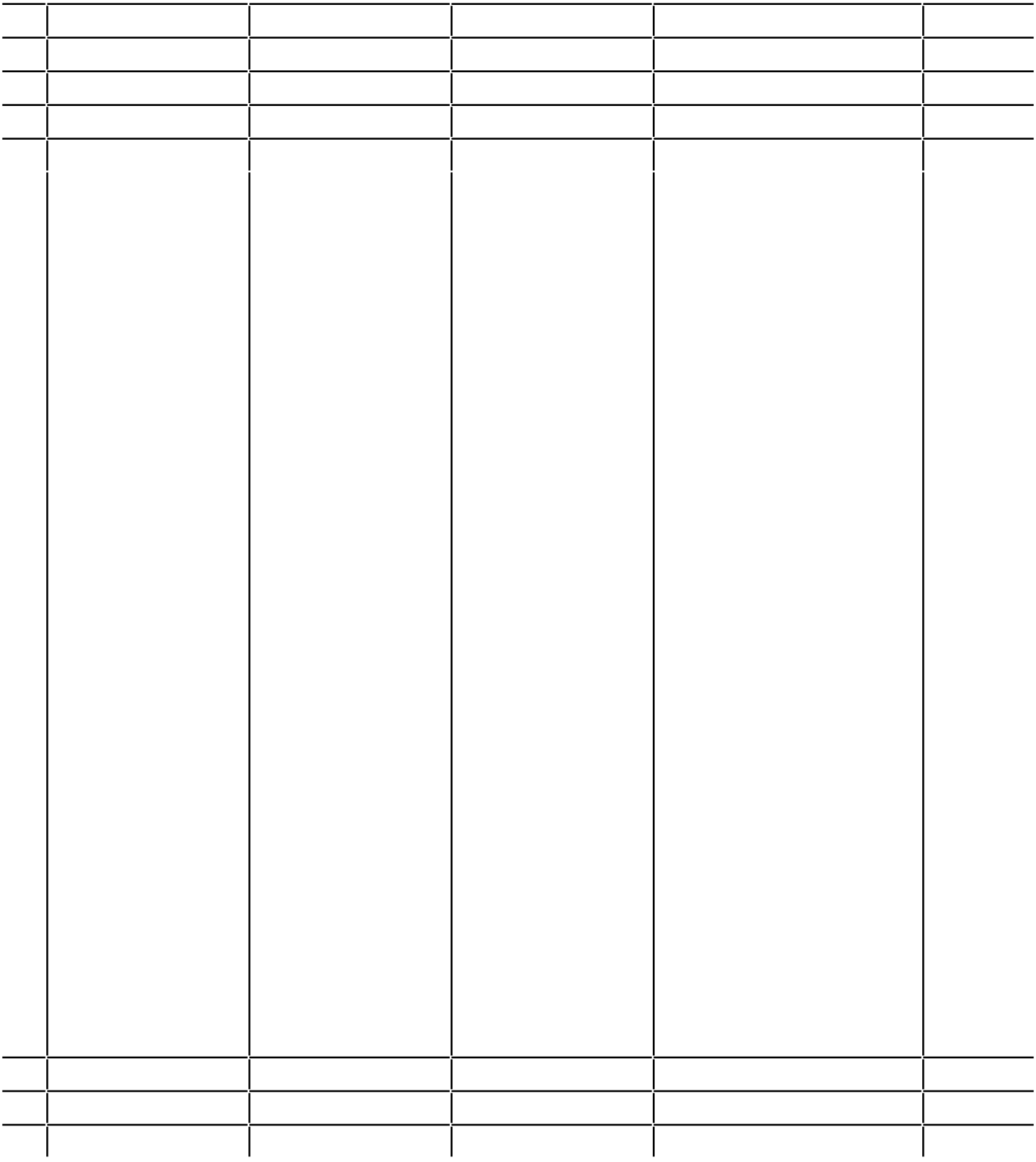
PERMITTING REQUIREMENTS FOR DR TECHNOLOGIES

	Type of Permit	Applicable LORS (Laws, Ordances, Regulations, Standards)	Agency Name	Highlight Permit Require-ments including trigger levels, exemptions, etc.	Issue
C. Engines	Air/toxics (NG or diesel) 5kW--10MW		BAAQMD--Bay Area Air Quality Management District		
	Air/toxics		South Coast Air Quality Management District		
	Air/toxics		San Diego AQMD		
	Air/toxics		San Luis Obispo AQMD		
	Air/toxics		Sacramento AQMD		
bines	(NG) 500kW--25/50MW				



	NPDES--National Pollutant Discharge Elimination System		Local regional water quality control board	Discharges (direct or runoff) to state waters. Regulatory criteria contained in Basin Plan, which covers acceptable effluent criteria including metals concentrations, toxicity.	
	Industrial Wastewater Discharge Permit		Local water pollution control plant adminsters federal regulations	A permit is required only if process effluents are directed to the sanitary sewer system.	

	Construction permit	California Uniform Building Code	City or County Building Departments	Fire Permits--underground fire system, overhead fire sprinklers, fire alarm, tank installation, gas detection system, site prep., sewer and fire line permit. Electrical permits--underground conduit Building Permits--plan check, building permit, seismic fee, plumbing and mechanical permit and landscape.	
	Land development review	Local zoning law	City or County Building or Planning Departments	Review of impact on city/ county services, infrastructure, traffic, sewer, water, fire, zoning, easements, etc.	
	Environmental Review and Conditional Use Permit	CEQA--California Environmental Quality Act	City or County Planning Commission	Planning Commisison acts as lead agency for CEQA review which will involve several City/County departments, the public, California State Clearinghouse and state and federal agencies.	An initial st Environmer Form (from Guidelines) information adequate.
	Hazardous Materials--Emergen cy Response Plan		Local Fire Department		
	Harardous Waste Generation		Local City/County Health Department and the California Department of Health Services		
	Air/Toxics	BAAQMD Regulation # 1-110.8	BAAQMD--Bay Area Air Quality Management District	BAAQND requires a permit for any new emission source which results in a net increase in non-attainment pollutants.	A project m it emits very emisisons.
	1kW-1MW				
d	1kW-1MW				



N/sec.					

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SELECTED LOCAL GOVERNMENT DR POLICIES

SAN DIEGO ASSOCIATION OF GOVERNMENTS REGIONAL ENERGY PLAN RESOURCE PORTFOLIO

End-Use Sectors	Energy Resource Type	Preferred Resources (in descending order of preference within ea. type)
Residential, Commercial, Industrial, and Public Facilities	Demand-Side Management	Lighting Appliances/equipment/motors Water heating Pools/spas Space conditioning/ventilation Load management
	Direct Application Renewables	Solar Biomass Geothermal Ocean (R&D)
	Land-Use Coordination	Mix/density intensification Locational efficiency Efficient site design
	Electric Generation Fuels & Resources (regardless of location)	Wind Solar photovoltaic Geothermal Natural gas Biomass Hydro Solar thermal Ocean (R&D)
	Electric System Efficiencies & Generation Configurations	Transmission & distb. loss reduction Small in-region distributed plants Repower existing large in-region plants Large out-of-region purchases Large in-region central plants
	Direct Combustion Thermal Fuels	Natural gas Propane
	Transmission Capacities	Natural gas Electricity

SAN DIEGO REGIONAL ENERGY PLAN MEASURE 14:
SMALL-SCALE DISTRIBUTED POWER GENERATION

Description

This measure promotes the REP portfolio's top electric generation configuration preference: small distributed power plants. This is a growing type of electric supply option that avoids the magnitude of environmental impacts caused by traditional large power plants; takes advantage of technology advancements, such as fuel cells and solar photovoltaics; and which can be sited closer to customer demands, thereby reducing electric transmission line requirements. It is also consistent with the increasing number of independent power producers, and the flexibility needed to market small increments of output quickly in an increasingly competitive marketplace.

Distributed power generation facilities are considered to be those that fall beneath state or federal siting thresholds, i.e., thermal power plants under 50 MW. Examples that may be developed in the region include natural gas-fired combustion turbines, natural gas-fired fuel cells, and solar photovoltaic units.

The objective of this measure is to increase awareness of distributed power generation technologies generally; to ensure that institutional and legal barriers do not impede their development, e.g., siting standards; and to encourage their use when meeting small increments of the region's electric needs, perhaps in conjunction with research and development funds obtained via Measure 1.

Responsible Organizations

Efforts on this measure should be guided by a working group, including SDG&E, independent power producers, and local government planning departments. Additional technical support would be available from the CEC, EPRA, and USDOE.

Actions & Targets

Actions	Targets
14.1 Establish working group of key stakeholders as listed above.	Working group establishment by mid-1995.
14.2 Disseminate distributed power generation information to local jurisdictions.	All local jurisdictions by 1996.
14.3 Evaluate local ordinances to identify and remove potential impediments to distributed generation.	All local jurisdictions should be evaluated by 1996, followed by regulatory revision processes where needed.
14.3 Seek opportunities to demonstrate distributed generation technologies.	Demonstration of major distributed technologies at selected sites by 2000, including solar photovoltaics and fuel cells.

Schedule

The priority of this measure is largely dependent upon the need and market for new electric supplies. These issues are currently in flux in California, and should be monitored so that its priority can be more accurately judged.

Costs & Savings

Distributed power generation costs are becoming increasingly competitive with traditional large central plants, and this trend is expected to accelerate as technologies such as solar photovoltaics improve over time. Small-scale distributed generation can save money in several ways: reduced development lead time; easier siting and environmental mitigation; avoided electric transmission requirements; and ultimately more competitive electricity costs for ratepayers. This type of power generation is also more accessible by regional technology manufacturers and service providers, again reinforcing the self-sustaining nature of the region's energy agenda.

Affected Economic Resources

Distributed generation should improve electricity supply economics by allowing for smaller investment increments, posing less risk and lead time, along with avoided transmission upgrades. Also, distributed generation lends itself to independent power generation with its attendant increases in marketplace competition and jobs.

Affected Environmental Resources

Distributed generation is a means of reducing the environmental impacts of power production by using smaller plants and renewable resources. Additionally, locating distributed plants closer to consumer loads can avoid the environmental disturbance of larger electric transmission and substation facilities.

Progress Benchmarks

Number of distributed generation proposals; number of jurisdictions adopting distributed generation siting standards; and monitoring of facilities processes under those standards to determine the efficacy of the standards.

The concept of a ***distributed utility*** is a departure from building large scale power centralized plants and extensive transmission lines to deliver electricity. The idea is to have more, smaller power generating facilities that serve smaller areas. These type of facilities produce electricity closer to where it is needed, and increases the efficiency of the system.

Xiii. Goal: Encourage Development of Distributed Facilities

Policy 47. Distributed utility facilities should be encouraged because they may significantly increase the efficiency of the power system and may increase the use of local renewable fuel sources. They may also reduce environmental impacts and increase the economic well being of the county.

Policy 48. Encourage the development of small-scale power generating facilities which have substantially less environmental, social, and economic impacts. Such facilities could provide energy for local use, assist in the development of a more distributed utility, and may include solar, wind, biomass, and other renewable energy technologies.